

CLEAN VERSION OF ALL CLAIMS

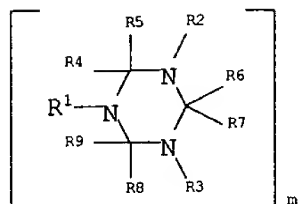
1. A process for copolymerizing ethylene or propylene together or with other olefinically unsaturated compounds, which comprises carrying out the polymerization in the presence of a catalyst system which comprises the following components:

- A) a complex of a transition metal with one or two substituted or unsubstituted 1,3,5-triazacyclohexane ligands or corresponding ligands in which one or more of the ring nitrogen atoms are replaced by phosphorus or arsenic atoms, and
- B) if desired one or more activator compounds.

2. A process for copolymerizing ethylene or propylene together or with other olefinically unsaturated compounds at temperatures from 20 to 300°C under pressures from 5 to 4000 bar, which comprises the following steps:

- a) contacting a complex of a transition metal with one or two substituted or unsubstituted 1,3,5-triazacyclohexane ligands (A) with at least one activator compound (B),
- b) contacting the reaction product from step (a) with the olefinically unsaturated compounds under polymerization conditions.

3. (amended) A process as claimed in claim 1, wherein a compound of the formula I



in which the variables have the following meanings:

- M a transition metal of groups 4 to 12 of the periodic table,
 R^1-R^9 hydrogen or organosilicon or -carbon substituents with 1 to 30 C atoms, it being possible for two geminal or vicinal R^1 to R^9 radicals also to be connected to form a five- or six-membered ring, and it being possible, when m is 2, for an R^1-R^9 radical of in each case one triazacyclohexane ring to form together with a substituent on the other triazacyclohexane ring a bridge between the two rings,
X fluorine, chlorine, bromine, iodine, hydrogen, C_1-C_{10} -alkyl, C_6-C_{15} -aryl or alkylaryl with 1 to 10 C atoms in the alkyl radical and 6 to 20 C atoms in the aryl radical, trifluoroacetate, BF_4^- , PF_6^- , or bulky noncoordinating anions,
m 1 or 2,
n a number from 1 to 4 which corresponds to the oxidation

Sub B2
const. → state of the transition metal M

is employed as component (A).

4. (amended) A process as claimed in claim 1, wherein M is a transition metal of group 6 of the periodic table.

5. (amended) A process as claimed in claim 1, wherein mixtures of ethylene with C₃-C₈- α -olefins are employed as monomers.

6. (amended) A process as claimed in claim 1, wherein an aluminoxane is employed as activator compound (B).

7. (amended) A process as claimed in claim 1, wherein a borane or borate having at least 2 substituted aryl radicals is employed as activator compound (B).

8. (amended) A process as claimed in claim 3, wherein at least one of the radicals R¹, R² and R³ is different from the other radicals in this group.

9. (amended) A catalyst for polymerizing olefins, comprising at least one transition metal complex (A) as defined in claim 1 and a support material and, if desired, one or more activator compounds (B).

10. A process for polymerizing or copolymerizing olefins wherein the polymerization or copolymerization is carried out in the presence of a catalyst as claimed in claim 9.

11. A transition metal complex of the formula I as defined in claim 3, wherein at least one of the radicals R¹, R² and R³ is

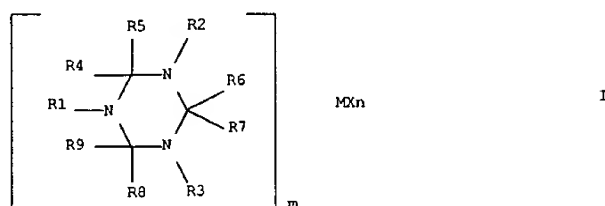
different from the other radicals in this group.

12. A transition metal complex of the formula I as defined in claim 3, wherein m is 2 and one radical R^1-R^9 of one triazacyclohexane ring together with one of these substituents of the other triazacyclohexane ring forms a bridge between the two rings.

13. (amended) ~~The use of a complex of a transition metal as defined in claim 1 in the copolymerization of ethylene or propylene together or with other olefinically unsaturated compounds.~~

MARKED-UP VERSION OF AMENDED CLAIMS

3. (amended) A process as claimed in claim 1 [or 2], wherein a compound of the formula I



in which the variables have the following meanings:

M a transition metal of groups 4 to 12 of the periodic table,
 R^1 - R^9 hydrogen or organosilicon or -carbon substituents with 1 to 30 C atoms, it being possible for two geminal or vicinal R^1 to R^9 radicals also to be connected to form a five- or six-membered ring, and it being possible, when m is 2, for an R^1 - R^9 radical of in each case one triazacyclohexane ring to form together with a substituent on the other triazacyclohexane ring a bridge between the two rings,
X fluorine, chlorine, bromine, iodine, hydrogen, C_1 - C_{10} -alkyl, C_6 - C_{15} -aryl or alkylaryl with 1 to 10 C atoms in the alkyl radical and 6 to 20 C atoms in the aryl radical, trifluoroacetate, BF_4^- , PF_6^- , or bulky noncoordinating anions,

m 1 or 2,

n a number from 1 to 4 which corresponds to the oxidation state of the transition metal M is employed as component (A).

4. (amended) A process as claimed in [any of claims 1 to 3] claim 1, wherein M is a transition metal of group 6 of the periodic table.

5. (amended) A process as claimed in [any of claims 1 to 4] claim 1, wherein mixtures of ethylene with C₃-C₈- α -olefins are employed as monomers.

6. (amended) A process as claimed in [any of claims 1 to 5] , claim 1, wherein an aluminoxane is employed as activator compound (B).

7. (amended) A process as claimed in [any of claims 1 to 5] claim 1, wherein a borane or borate having at least 2 substituted aryl radicals is employed as activator compound (B).

8. (amended) A process as claimed in [any of claims 3 to 7] claim 3, wherein at least one of the radicals R¹, R² and R³ is different from the other radicals in this group.

9. (amended) A catalyst for polymerizing olefins, comprising at least one transition metal complex (A) as defined in [claims 1 to 4, or 8] claim 1 and a support material and, if desired, one or more activator compounds (B).

13. (amended) The use of a complex of a transition metal as

1. The first step is to identify the problem or question that needs to be addressed. This involves understanding the context and the specific requirements of the task.

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